The skilled factory technician—like his medieval forebear, the craftsman in the small guild shop—serves a long and exacting apprenticeship, learning to use the tools and techniques of his trade.

In IBM Germany's West Berlin Plant, typical of many throughout World Trade, a young man trains for three-and-a-half years to shape his technical aptitude into professional competence. Completing his instruction in precision-toolmaking and electrical engineering, he must show his skill by passing a rigorous examination in another plant. In Berlin, IBM and another company, the Siemens group, exchange apprentices for the test. The excellent grades of IBM's employees testify to the thoroughness of the company's training program.

Unlike his predecessor, the modern apprentice is well paid during his training. The major reward of the system, however, is the same: a capable worker, proud of his craftsmanship and his company.

in pursuit of skill

As America's first orbiting astronaut made his historic space flight, many decisions had to be made within seconds—decisions based on millions of calculations.

These decisions were made by men, the calculations by an IBM computer system at the NASA–Goddard Space Flight Center near Washington, D. C.

During the entire mission, the computer system gathered data from tracking stations around the world and automatically flashed the results of its computations to display boards at Cape Canaveral, 1100 miles away.

The first question—should the spacecraft be allowed to go into orbit—had to be answered while there was still time to bring the astronaut safely down in a planned recovery area. The computers made their calculations, and a green light flashing on the display board recommended "GO" to the Flight Director.

Meanwhile, the computers were predicting the spacecraft's orbital path. These predictions were continuously refined as data poured in from the Canary Islands, Australia, Mexico and other points in the global tracking network.

The computers also calculated the exact moment for firing the retro-rockets to have the spacecraft land in a predetermined area. Finally, the computers predicted the impact point so recovery craft could speed to the scene.

Many IBM people, including mathematicians, programmers, engineers and astronomers, were part of the government-industry team that contributed to Mercury's success. Their efforts demonstrated again IBM's leadership in information-handling and control systems.

IBM®

This advertisement tells of IBM and Project Mercury. It ran in domestic and international editions of major U.S. newspapers the day after the successful orbit shot. It also appeared in several European newspapers and in color in the U.S. edition of LIFE Magazine.

This advertisement is appearing in full color in selected international publications.

THE IBM RAMAC ABOVE WORKS AS A RESEARCH ASSISTANT AT THE LABORATORY FOR SOIL AND CROP TESTING, OOSTERBEEK, NETHERLANDS

More food from land won from the sea

There's many a fat field abloom in Holland that once fed only the fishes in the shallows of the salt North Sea. In six centuries, ever since windmills first made it possible to pump the polders dry, the Dutch have diked and drained nearly a million acres. Land won from the sea is doubly precious in the most crowded country in the world.

The Dutch have pampered their fields into unmatched fertility; but they are still not satisfied. Now they want to enrich the soil even more with nutrients formulated, down to the last cupful, for *each* of the country's 2.2 million plots of land.

An IBM RAMAC system simplifies this huge task by storing a mass of soil test data in its whirling disk "memory." Laboratory analyses, along with facts on crops, soil depth and location, can then be compared instantly with the stored data. Seconds later, RAMAC prints detailed fertilizer advice for each sample. Applied to all Dutch farms, this could boost crops as much as adding an extra province.

IBM

You may never see an IBM RAMAC beside the windmill on a blue Delft plate, but it follows in the same Dutch tradition: put technology to work for bigger harvests, a better life.

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This advertisement is appearing in full color in selected international publications.

FAMILIAR COPENHAGEN SIGHTS: IN THE RAADHUSPLADSEN, THE LURERBLOWERS STATUE; IN OFFICES, THE IBM ELECTRIC.

Fanfare in Copenhagen

Striding endlessly past Copenhagen's City Hall, these bronze warriors with their antler-like lure horns blow a silent fanfare for the days when dragon ships ringed the western world. Those Viking ships, which bore such ear-tingling names as "Horse of the Gull's Track" and "Elk of the Fjord," were superbly efficient—and strikingly handsome.

Today the Danes have again shown that useful things can be beautiful. The Viking past echoes in the magnificent design that turns chairs and plates into works of art, makes Danish furniture, silverware, porcelains sought after the world around.

At IBM, we like to think the IBM Electric typewriter is itself a notable combination of fine design and performance. The Danes apparently agree, for they received it enthusiastically, have kept its sales soaring year after year. We can almost imagine them reviving the old Viking custom and calling their IBM Electrics "The Quiet Word-Smith," "Wolf for Work," "Master of the Letter-Weavers." Any of these may be appropriate—but none could make us prouder than the name already given IBM Electrics by secretaries everywhere: "Friend." Let the lure horns sound!

IBM

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JAPANESE SCRIPT INDICATES THAT MAP SHOWN IS WEATHER CHART AUTOMATICALLY PRINTED BY AN IBM COMPUTER AT JAPAN METEOROLOGICAL AGENCY IN TOKYO. THE COMPUTER CONSULTS LATEST ATMOSPHERIC CONDITIONS ON MAGNETIC TAPE REELS, COMPILES WEATHER PREDICTIONS DAYS IN ADVANCE.

Drawing the fangs of the Tai-Fu dragon

This is Tomo, a fishing village that sleeps more soundly these days because of an IBM computer.

Since time began, Tomo and a thousand other Japanese towns have trembled under the attack of the dread Tai-Fu, the Great Wind. Pouncing without warning, boiling the sea up over the shores, typhoons rip across the islands a dozen times a year.

But today Tai-Fu has lost one of its deadliest weapons—surprise. Typhoons move so fast that they often strike before their course can be laboriously plotted by hand. Now Japan's weather experts have found something even faster—an IBM computer.

Applying Numerical Weather Forecasting techniques, the computer digests huge masses of data to predict a storm's path so quickly that even Tai-Fu can't keep ahead. The Tomos of Japan can be warned in time to batten down, board up, take to high ground.

Twice each day hundreds of ships and weather stations from India to the Arctic radio their local winds, temperature, barometric pressure to the Japan Meteorological Agency in Tokyo. There, the IBM computer needs little more than an hour to run this data through complex equations and produce a weather forecast for the next two to three days—a task that would take 180 years working 40 hours a week with a desk calculator.

The computer even prints its own weather maps, like the one shown in the photograph predicting conditions over thousands of square miles.

Numerical Weather Forecasting is improving all the time; already meteorologists talk of weather predictions a month ahead. When that day comes, some of the chief forecasters will probably be weather-wise IBM computers, just as they are today.

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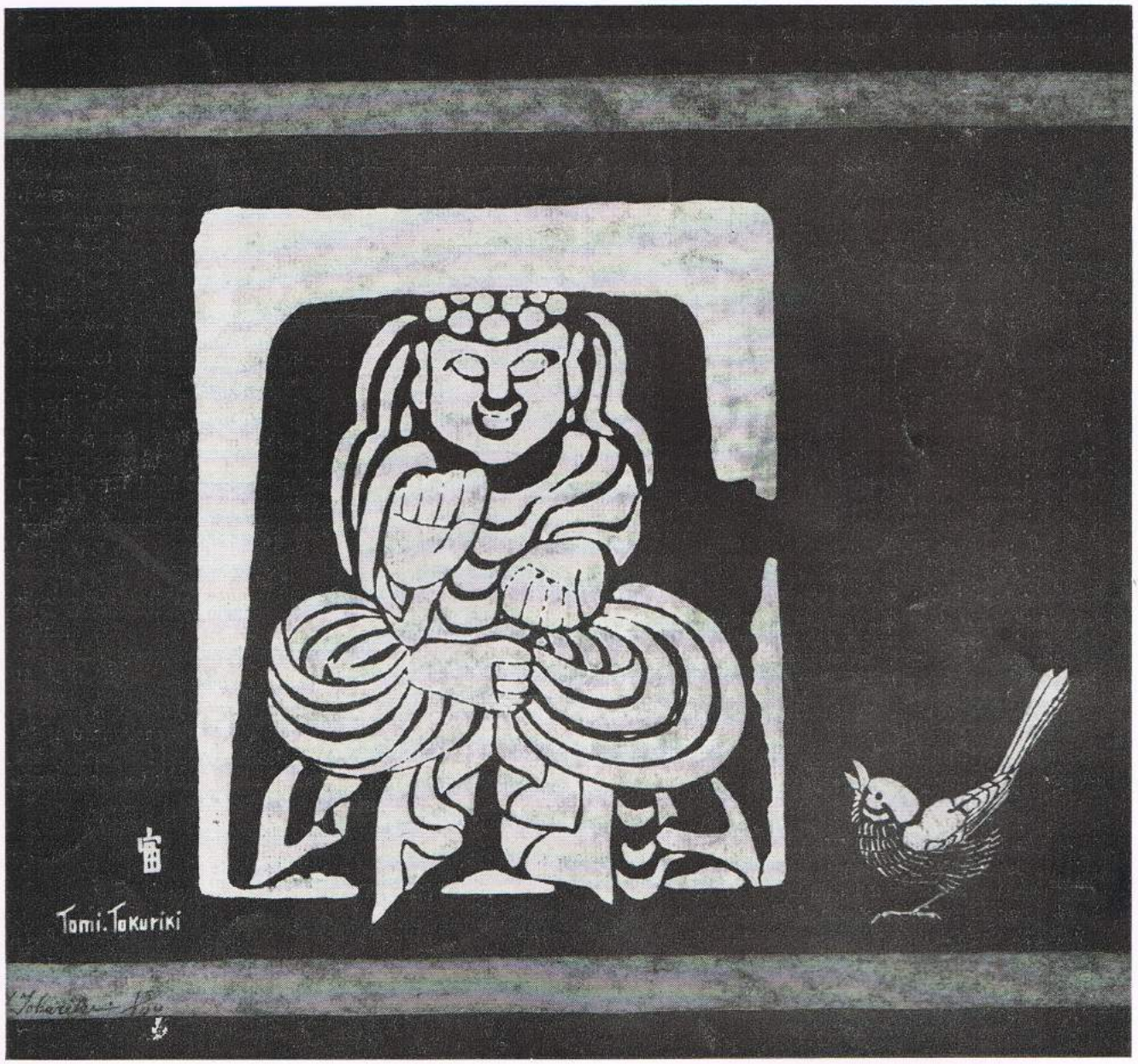

SOSAKU

means "creative." It is the eminently apt term used to describe the work of Tokuriki (whose "Buddha and the Bird" is shown here) and other members of the Bi-No-Den-Do or "Shrine of Beauty" group. These Japanese artists are intent on reviving the technique of wood block printing which reached its artistic peak in seventeenth-century Japan. Other works of Tokuriki in last month's "Communication Orient" display at the IBM Art Gallery in New York City are "Deer" and "Festival." Gallery space was also devoted to the first public showing of the Kostew collection of ancient Oriental writing materials: ink sticks and pads, water pots, brush rests and holders. Whether of jade, silver, bronze, ivory or porcelain — whether painted or carved in the guise of a flower or a dragon—they show that an implement, as well as the work it produces, can be artistic. They reflect the delicate strength that has marked Oriental calligraphy ever since, centuries ago, bamboo strips were bound together to form the first scrolls.

IBM 7070-1401 COMPUTER, FOREGROUND, HELPS KEEP SWISS RAIL TRAFFIC RUNNING SMOOTHLY: HERE, NEAR GÖSCHENEN, ST. GOTTHARD LINE TO ITALY CARRIES A TRAIN THROUGH THE ALPS EVERY EIGHT MINUTES.

How to unscramble an Alpine maze

limbing around, between, over, and under the Alps, the Swiss ederal Railways packs into 1,800 miles of right-of-way enough rrain, traffic, and troubles for a line ten times its size.

Every 1,000 yards the tracks leap a torrent; every nine miles they nnel a mountain. Express trains race to link the Baltic to the lediterranean; leisurely freights carry commuting cows to Alpine astures. Blizzards and avalanches keep track crews busy. o keep this rugged railway ticking like a fine watch, SFR ses advanced equipment both on the line and in the office.

Management's latest assistant is an IBM data processing system. Figuring car mileages and rentals, determining the rates and shortest routes between 1,200 stations, making up payrolls, analyzing costs, forecasting traffic volume—the computer cuts time, trims expenses.

Railways around the world use IBM electronic computers to handle the immense amount of information that helps run a transportation system. A new sound effect has been added to the traditional clackety-clack of the wheels and the distant wail of an engine whistle—the low hum of a computer hard at work.

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This advertisement is appearing in color in selected international publications.

HERE IN THE WILD HUINCO GORGE, THE SANTA EULALIA RIVER IS BEING PUT TO WORK TO PRODUCE ELECTRIC POWER FOR METROPOLITAN LIMA. THE IBM 1401 COMPUTER IN THE FOREGROUND WILL HELP LAY OUT AN EFFICIENT POWER DISTRIBUTION SYSTEM.

IBM in the land of the Incas

Once this lovely, lonely valley, where the Rio Santa Eulalia tumbles down the Andes toward the Pacific, saw armoured conquistadors on their way to carve an empire. Now again, helmeted conquerors have moved in—construction gangs harnessing the river with roaring machines. Here a vast hydroelectric project will double the power supply of Lima, Peru's capital.

Reinforced with water piped—at an altitude of 14,000 feet—beneath the Cordillera de los Andes, the Santa Eulalia will be turned out of its bed, poured into a tunnel driven eight miles through the mountains. At tunnel's end the torrent will leap 4,000 feet down to drive four great generators in a cavern carved deep within the living rock. This one station will produce more electricity than Lima now receives from all its power plants.

The IBM computer shown on a ledge above the valley will help the Lima Light and Power Company distribute this power efficiently. Analysing a host of complex factors, the data processing system will show the best sites for transformers, substations, power lines. Later the computer will be equally valuable to Lima Light for accounting and financial analyses.

When the first Europeans came to Peru they found the Incas already solving mathematical problems by moving grains of maize on a marked board, recording the results by knots in a string—and getting accurate answers faster than the newcomers could with pen and paper. With this tradition, no wonder the heirs of the Incas use the most advanced of mathematical aids—an IBM computer.

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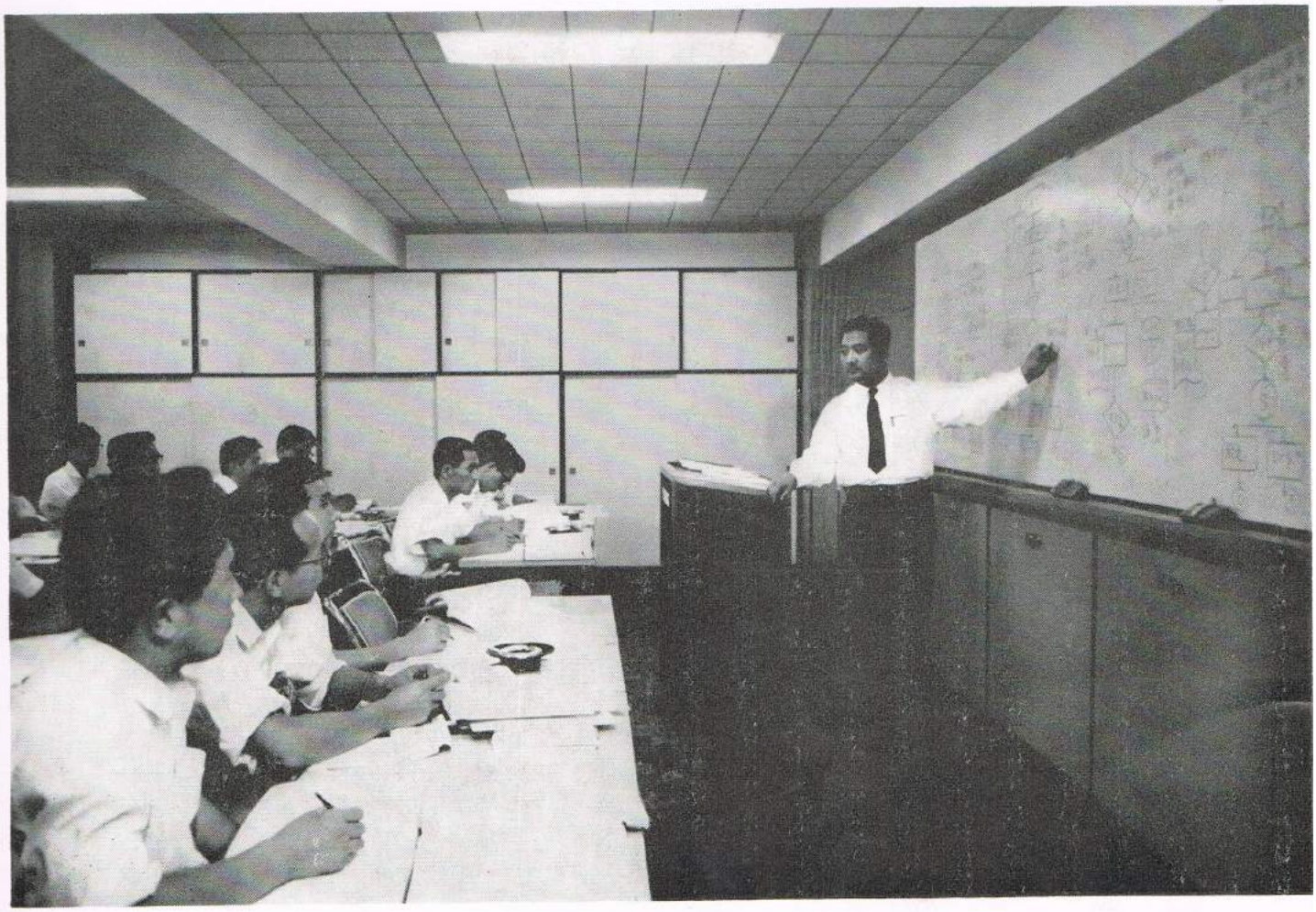
This advertisement is appearing in full color in selected international publications.

Japan's House of Learning

By year's end, 16,000 people will have attended courses in IBM Japan's education program. Whether IBM customer, IBM salesman or systems engineer, the new locus of their learning will be classrooms such as this one in Japan's new Education Center in the Kawase Building, Tokyo. The new Center caps the drive to centralize and streamline Japan's education effort. Its thirteen classrooms have the latest teaching aids, including blackboards which convert to projection screens. In a machine room, Unit Record theory can be tested in practice. Advanced programming courses will span the IBM 1620, the 1400 and 7000 series. A salesmanship training class has already been completed. "IBM Japan," says J. A. Dollard, World Trade Manager of DP Sales Training, "has made great progress in changing the emphasis of its education program and the curriculum it offers to customer and IBM representative."



THIS IBM 1620, SHOWN AT THE RANCH OF SEÑOR JOSÉ ROJO NEAR TOLUCA, IS USUALLY FOUND IN AGRO PECUARIA'S MEXICO CITY OFFICE.

Writing the menu for Señor Rojo's cows

Romantic old Mexico. Placid cows, red tiled roofs, and white walls that reflect a way of life unchanged for centuries . . .

Don't let that background in the picture fool you. Only the architecture is traditional. This is the new Mexico where vigor, ideas, and technology are changing almost everything—even the cows.

These Holsteins, for example. Once they might have lived rather simply on grass alone. Now their daily menu is fortified with feed carefully formulated by an IBM computer so that it meets the strictest nutritional requirements.

Agro Pecuaria, one of Mexico's leading cattle-feed producers, uses an IBM computer to work out new menus from literally millions of possible combinations of ingredients which change constantly in price and availability. The result: improved feed—at a 16% saving.

Robust cows are only one instance of how IBM systems help in today's Mexico. A fresco there shows Quetzalcoatl, the Aztec god, returning on a raft with examples of new learning to blend with Mexico's rich heritage. If his raft landed today, there just might be an IBM computer stowed away somewhere.

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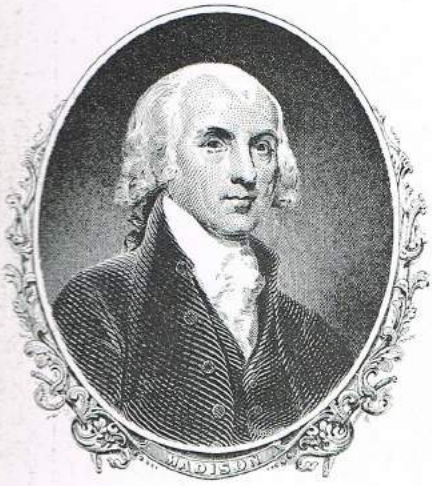

AUTHOR!

IBM's reputation is firm among scholars. With precise speed, its computers helped index the works of Thomas Aquinas and decipher the Dead Sea Scrolls. And just recently, an IBM 7090 assisted in tying up a loose string for scholars of the American Revolution.

In 1787-88, the Federalist Papers were the talk of New York. Written in the elegant, somewhat oratorical style of the day, they appeared anonymously (sometimes signed "Publius") in various New York newspapers. And they pressed an urgent theme with persistent skill: that New York should adopt the proposed United States Constitution along with the strong central government prescribed by it.

The authors are well known. They were James Madison, Alexander Hamilton and John Jay. Moreover, scholars have established the authorship of most of the 85 Papers. But numbers 49 through 58, and 62 and 63, were in doubt. With John Jay ruled out (his style was easy to detect), were they the writings of Madison or of Hamilton? During his lifetime, neither had provided a clue. Each had changed his ideas somewhat from those advanced in the Papers, and each maintained a calculated diffidence toward the other's authorship.

It took an IBM 7090 to break this stalemate. It also required the intellectual curiosity and energy of Professor Frederick Mosteller of Harvard and Professor David Wallace of the University of Chicago. Using the 7090 at the Massachusetts Institute of Technology, they programmed it with words typical of the styles of both men. This was no easy task. It took, in fact, three years. Analysis had revealed that the mean sentence lengths in Hamilton's and Madison's Federalist prose are, respectively, 34.55 and 34.59 words. But the professors proposed to use "marker words" such as "vigor," "direction" and "whilst." A "marker word" such as "upon," for instance, occurs at the rate of three in each 1,000 words of Hamilton text, and only once in about 6,000 words of Madison prose.

In the end, however, it was the filler words which proved that Madison, not Hamilton, was the author. Words such as "also," "an," "by," "of," "on," "this," 'to" were crucial. Surveying them, the 7090 pointed the finger of authorship unmistakingly at James Madison. Professor Mosteller reports that "essay number 56 shows odds of 800 to 1 in favor of Madison, and the data were exceedingly strong for Madison in all the rest."

AUTHOR!